

**M·C·C·**

Micro Commercial Components



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## Features

- Halogen free available upon request by adding suffix "-HF"
- SOT-23 Plastic-Encapsulate Transistors
- Capable of 0.3Watts(Tamb=25°C) of Power Dissipation.
- Collector-current 0.5A
- Collector-base Voltage 40V
- Operating and storage junction temperature range: -55°C to +150°C
- Marking : J3
- Lead Free Finish/RoHS Compliant ("P" Suffix designates RoHS Compliant. See ordering information)
- Epoxy meets UL 94 V-0 flammability rating
- Moisture Sensitivity Level 1

### Electrical Characteristics @ 25°C Unless Otherwise Specified

Symbol	Parameter	Min	Max	Units
<b>OFF CHARACTERISTICS</b>				
$V_{(BR)CBO}$	Collector-Base Breakdown Voltage ( $I_b=100\mu Adc$ , $I_e=0$ )	40	---	Vdc
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage ( $I_b=0.1mA$ , $I_e=0$ )	25	---	Vdc
$V_{(BR)EBO}$	Emitter-Base Breakdown Voltage ( $I_e=100\mu Adc$ , $I_b=0$ )	5.0	---	Vdc
$I_{BO}$	Collector Cutoff Current ( $V_{CB}=40Vdc$ , $I_e=0$ )	---	0.1	$\mu Adc$
$I_{EO}$	Collector Cutoff Current ( $V_{CE}=20Vdc$ , $I_e=0$ )	---	0.1	$\mu Adc$
$I_{EBO}$	Emitter Cutoff Current ( $V_{EB}=5.0Vdc$ , $I_b=0$ )	---	0.1	$\mu Adc$

### ON CHARACTERISTICS

$h_{FE(1)}$	DC Current Gain ( $I_b=50\mu Adc$ , $V_{CE}=1.0Vdc$ )	120	350	---
$h_{FE(2)}$	DC Current Gain ( $I_b=500\mu Adc$ , $V_{CE}=1.0Vdc$ )	40	---	---
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage ( $I_b=500\mu Adc$ , $I_e=50\mu Adc$ )	---	0.6	Vdc
$V_{BE(sat)}$	Base-Emitter Saturation Voltage ( $I_b=500\mu Adc$ , $I_e=50\mu Adc$ )	---	1.2	Vdc
$V_{EB}$	Base-Emitter Voltage ( $I_e=100\mu Adc$ )	---	1.4	Vdc

### SMALL-SIGNAL CHARACTERISTICS

$f_T$	Transistor Frequency ( $I_b=20\mu Adc$ , $V_{CE}=6.0Vdc$ , $f=30MHz$ )	150	---	MHz
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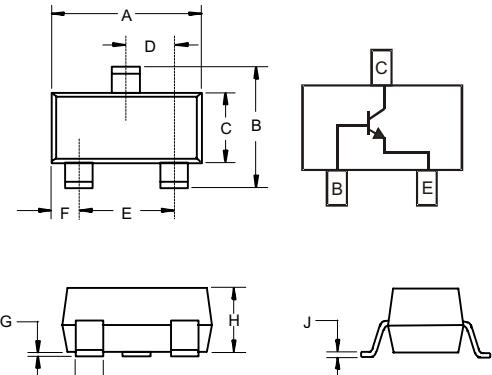
### CLASSIFICATION OF $h_{FE(1)}$

Rank	L	H
Range	120-200	200-350

**MMS9013-L**  
**MMS9013-H**

**NPN Silicon**  
**Plastic-Encapsulate**  
**Transistor**

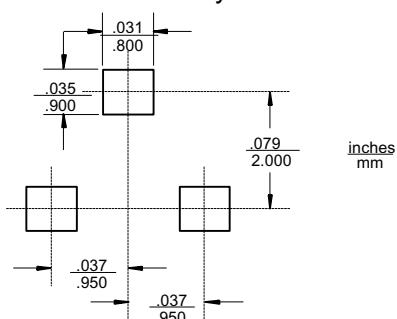
### SOT-23



### DIMENSIONS

DIM	INCHES		MM		NOTE
	MIN	MAX	MIN	MAX	
A	.110	.120	2.80	3.04	
B	.083	.104	2.10	2.64	
C	.047	.055	1.20	1.40	
D	.035	.041	.89	1.03	
E	.070	.081	1.78	2.05	
F	.018	.024	.45	.60	
G	.0005	.0039	.013	.100	
H	.035	.044	.89	1.12	
J	.003	.007	.085	.180	
K	.015	.020	.37	.51	

### Suggested Solder Pad Layout



## Ordering Information :

Device	Packing
Part Number-TP	Tape & Reel; 3 Kpcs/ Reel

Note : Adding "-HF" suffix for halogen free, eg. Part Number-TP-HF

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